

B.E./B.TECH. Degree Examination, December 2020

Seventh Semester

**EE16703 - High Voltage Engineering**

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

**PART A - (8 X 2 = 16 marks)**

1. The Ground wire is a conductor run ..... to the main conductor of the transmission line supported on the same tower and earthed at every equally and regularly spaced towers.  
(A) Series (B) Parallel (C) Vertical (D) series as well as parallel
2. Which of the following gas has been used as insulating medium in electrical appliances?  
(A) Carbon dioxide (B) Nitrogen (C) Sulphur Hexafluoride (D) Freon
3. The high frequency resonant transformer is called as  
(A)Current coil (B) Pressure coil (C) tesla coil (D) inductive coil
4. The voltage that causes a flashover at each of its application under specified conditions when applied to test objects as specified is called  
(A)50 % flash over (B) 100 % flash over (C) 10 % flash over (D) 25% flash over
5. Define the front and tail times of impulse wave.
6. Explain the basic principle of Hall generator.
7. Define CVT and give its application.
8. Distinguish between flashover and puncture.

**PART B - (4 X16 = 64 marks)**

09. (a) (i) What are the causes for switching and power frequency over voltages? How are they controlled in power system? **(8)**  
(ii) Write short notes on (i) Rod gaps as protective devices (ii) Ground wires for protection of overhead lines. **(8)**

**(OR)**

- (b) What are the mechanisms by which lightning strokes develop and induce over voltages on overhead power lines? Give the mathematical models for lightning discharges and explain them. **(16)**

10. (a) What is meant by Ionization process? Derive the expressions for Townsend's first and second Ionization coefficient of gaseous dielectric material. **(16)**

**(OR)**

- (b) (i) Explain the various Breakdown mechanisms of vacuum dielectric material. **(8)**  
(ii) Discuss the different breakdown mechanisms in liquid dielectric materials. **(8)**

11. (a) Why is Cockcroft –Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram when it is unloaded and loaded. Derive an expression for total voltage drop and total ripple voltage of n-stage voltage multiplier circuit and hence deduce the condition for optimum number of stages. **(16)**

**(OR)**

- (b) Explain the construction and procedure for measurement of impulse voltage using standard sphere gap. Explain the parameters and factors that influence the sphere gap measurement. **(16)**

12. (a) (i) Explain the different aspects of insulation design and insulation co-ordination adopted for EHV systems. **(8)**  
(ii) Explain the method of impulse testing of high voltage transformers. What is the procedure adopted for locating the failure. **(8)**

**(OR)**

- (b) (i) Describe the various tests conducted in circuit breakers. **(8)**  
(ii) What are the different power frequency tests done on insulators? Mention the procedure for testing. **(8)**